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sciences. For a term to cover both of these concepts, "first principles" can be used.[7]

We shall then have the following table:

Primitives	*Concepts* (terms)	
	First Principles (propositions, truths, items of knowledge, assertions, statements)	*Axioms* (universal propositions, assertions of non-existence) *Postulates* (particular propositions, assertions of existence)

CHRISTINE LADD-FRANKLIN.

COLUMBIA UNIVERSITY.

NOTES ON THE PHILOSOPHY OF HENRI BERGSON

II. INDETERMINISM AND DYNAMISM

IN an earlier paper[1] I have discussed Bergson's "anti-intellectualism" and "immediatism." His indeterminism is, in the first place, a sequel to his anti-intellectualism. Since determinism is a device of the intellect, it is relative to the interest which moves the intellect, and can not therefore be imposed on life itself. Instead of being determined, the will is itself the author of the principle of determination; this principle is not its master but its creature. Thus, according to Schiller, "determinism is an indispensable postulate of science as such." As such it "has primarily a *moral* significance; it is an encouragement and not a revelation." And "it is quite easy to accept it as a methodological assumption without claiming for it any ontological validity." Whether we accept this postulate, or "the ethical postulate of freedom," is in the end "a matter of free choice," based on their relative serviceability.[2]

Such considerations as these support the indeterministic theory only provided two further assumptions are made. In the first place, it must be assumed that the agency which formulates and employs a certain category can not itself be subject to that category. This assumption plays a notable part in all philosophies which seek to distinguish and separate the subject of knowledge from all of its objects. It is argued that known object implies knowing subject; and that to make this subject itself object is to displace and falsify it. The *real* subject is that which in every case of knowledge functions as subject. The application to the question of determinism is obvious. It is argued that things are determined by virtue of being objectified; and that the objectifying activity itself thus escapes determination.

[7] See Baldwin's Dictionary of Philosophy and Psychology, Art. "Proposition."

[1] This JOURNAL, Vol. VIII., No. 25, p. 673.

[2] "Studies in Humanism," pp. 395, 396, 397.

But there is no reason why the subject of knowledge should not *in turn* be object of knowledge; or why, indeed, it should not be object of knowledge (in relation to another subject) at the same time that it is subject of knowledge. It is necessary only to suppose that the same term may stand in two or more different relations without forfeiting its identity. And unless we are to discredit knowledge altogether, we must suppose that the real nature of anything is revealed when it is object of knowledge, and in proportion as that knowledge is reflective and critical. It follows that a subject which objectifies other things, and renders them determinate, may itself be treated likewise; and that only when so treated is its real nature revealed. The subject is then free from determination only in so far as at any given time it is merely knowing and *not known*. But freedom in this sense is only a mode of nescience.

The other assumption which is needed to complete the argument is the assumption that laws are artificial. In this application it means that determinism is a fabrication of the intellect, imposed on a plastic material whose real inwardness it distorts. Bergson's criticism of determinism is based mainly on these grounds.[3] It constitutes one of the major applications of his most fundamental and original thesis, to the effect that the intellect spacializes time, and so necessarily falsifies every temporal process by expressing it as a "multiplicity of juxtaposition." Real time (*durée réelle*) is "heterogeneous" and "continuous," the real temporal process is a multiplicity of "interpenetration."[4] Action, as a real temporal process, is spacialized and falsified by mechanism, by finalism, and even by the majority of indeterminists. By all such "intellectualists," action is represented as a discrete process, with its component elements and successive phases in external juxtaposition to one another. Time is represented as a linear series, and the conditions of action, the moment of choice, and the result of action are correlated with the terms of this series. But such a diagram is both discrete and static; whereas the real action *flows,* and *endures.* The intellectualistic representation necessarily excludes freedom, because it is the representation of a completed action, and not of an action *as it goes on.* It is impossible in this way to represent alternative possibilities, for the representation either contains both possibilities, and so is contrary to fact; or it contains one of them to the exclusion of the other. And the finalistic scheme is as rigid as the mechanical scheme. For whether we conceive the later terms of the series as the sequel to the earlier, or the earlier as the foreshadowing of the later, in either case all the terms are *there,* in place, simultaneously and exclusively.[5]

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[3] *Cf.* "Time and Free Will," Ch. III., and "Creative Evolution," *passim.*

[4] "Time and Free Will," pp. 121, 128, 129, and *passim.*

Bergson's objection to the intellectualist's version of time rests, as does his whole polemic against intellectualism, upon a mistaken conception of the logical or analytical method.[6] The spacial representation of time is intended to be a representation of order, and to be a representation of time in so far, and only in so far, as time is orderly. The properties of order are the same whether in space, number, the color spectrum, the alphabet, or time. The series of points on a line furnishes a convenient case of order for purposes of demonstration; and it doubtless reflects the spacializing propensity of the human mind. But this habit has not prevented logicians from distinguishing the bare properties of order from those of space; otherwise there would be no difference between logic and geometry. It is as possible to discriminate and formulate logical properties by using a spacial representation, as it is to discriminate and formulate pure triangularity by using the representation of a particular triangle.

If Bergson were a better pragmatist, he would not assume, as he does, that ideas are mere reproductions of their objects. He would recognize the possibility of meaning non-spacial relations by spacial images. He would not insist as he does that we know number by "picturing" it, and that we can not escape the characteristics of the graphic imagination.[7] He would not fall into the loose common-sense use of the term "conceive" as *depict,* and confuse the arrangement of the instrumental image with the arrangement which it enables us to know. As a matter of fact, it is possible to know logical properties in their non-numerical character, and numerical properties in their non-spacial character, even though it be necessary to employ images that are both numerical and spacial. For the *postulates* of logic differ from those of arithmetic, and these in turn from those of geometry. If it were not possible to employ spacial images for the knowing of non-spacial things, Bergson himself would be even more helpless than those whom he criticizes. For his own favorite expressions are essentially spacial. What images do the words "flux," "continuity," "interpenetration," "deep-seated," "interconnection," "organization," and "fusion," suggest, if not spacial images? And yet Bergson assumes that these images may so function as to afford knowledge of that which is essentially non-spacial. If a figure of speech can so function, is there any reason why a geometrical figure, or algebraic formula, should not? In short,

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[5] *Op. cit.,* pp. 172 sq.

[6] See previous article, this JOURNAL, Vol. VIII., p. 673.

[7] "Time and Free Will," p. 78.

Bergson arbitrarily imputes to his intellectualist adversary a naïve identification of object and symbol which he disclaims in his own behalf.

It is not a question, then, of imputing to time the arrangement characteristic of logical or mathematical *symbolism,* but of imputing to time certain *properties* which may be known by *means* of this symbolism. Is time an order, or is it not? Is duration an extensive magnitude, or is it not? Now the orderliness of time is implied in all that Bergson has to say about it, *e. g.,* in its continuity and in its duality of "sense" or direction. Its multiplicity, even though it be characterized as "qualitative" rather than "juxtapositional," is orderly, in that if any phase *a* be later or older than another phase *b,* and *b* than a third phase *c,* then *a* is later or older than *c.* And as to time's being an extensive magnitude, Bergson's argument would appear to consist in pointing out that *temporal processes* are not *merely* extensive magnitudes—which no one, I think, would be disposed to deny. Velocity, *e. g.,* is an intensive magnitude. But this does not in the least prevent its being a ratio of the extensive magnitude, *d* (distance) and *t* (lapse, or interval of time). It may even be admitted that every temporal process or change, every function of time, has intensive magnitude; and this in no way contradicts the conception of time itself as an extensive magnitude. In other words, an intensive magnitude may be a function of extensive magnitudes, and may be computable or predictable in terms thereof.

That such is the case is proved by the predictions which science is actually enabled to make. Bergson's critique of astronomical prediction turns upon the fact that the symbol *t* in the equation of astronomy "does not stand for a duration, but for a relation between two durations, for a certain number of units of time, in short, for a certain number of *simultaneities.*"[8] In other words, the *t* of science is measured by some standard change, such as the motion of the hands of a clock. So that if a "mischievous genius" were to decree that all the movements of the universe should go twice as fast, the predictions of science would not be affected. Now, granting this, it follows only that science can not predict absolutely but only relatively. This does not in the least detract from the precision of the prediction or from its reference to the future. And the very statement of the objection assumes that time is an extensive magnitude. For if the movements of the universe were to go "twice as fast," this would mean that equal distances would be covered in *one half the time.*

Subsequently Bergson has the temerity to speak of a decree that

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[8] *Op. cit.,* p. 193.

time itself "shall go ten times, a hundred times, a thousand times as fast."[9] Apparently the rate of real time is to be measured by the immediate feeling of the "enduring" or aging of experience. If so, can the author explain, without making use of the conception of a pure extended time, what is meant by "a psychological duration *of a few seconds*";[10] or how temporal magnitudes are commensurable, how, *e. g.*, two lives with different experiences may be regarded as synchronous; or how one day may be regarded as fuller and richer than another? The fact is that no quantitative judgments whatsoever can be made concerning temporal processes that do not employ the notion of a simple extended (not spacial) temporal magnitude. And the predictions of science are made in terms of this component of change. The t of the equations of mechanics *means* this component.

As we have seen, Bergson is constantly confusing the symbol with what it means. To one who falls into this confusion it may appear that an equation can not refer to time because the structure of the equation itself is not temporal; because the symbols are simultaneously present in the equation. But if t is one of the terms of the equation, and t *means* time, then the equation means a temporal process. Furthermore, an equation may define a relation, such as $=$, $<$, or $>$, between temporal quantities, in which case the full meaning of the equation is still temporal. For changes, events, or even pure intervals may stand in non-temporal relations such as those above, without in the least losing their temporality. The supposition that an equation defining a relation can mean no more than the relation defined, is disproved by every formula of science. The formula, $c^2 = a^2 + b - 2ab. \cos \gamma$, does not mean merely equality, but a relation of equality *among the sides and an angle of a triangle.* The formula means something about triangles, by virtue of the meaning of its component variables, and despite the fact that the relation defined is the non-spacial relation of numerical equality. And similarly, a formula in dynamics, such as $g = v/t$, means something about a temporal process.

There remains one further instance of Bergson's failure to represent with any correctness the position of his deterministic opponent. It is a question of Paul's ability to predict Peter's choice, provided he knows "*all* the conditions under which Peter acts."[11] Bergson argues that in order to know absolutely all of the conditions under which Peter acts, and to know all about these conditions (including what they lead to), Paul would have to *be* Peter up to and including the moment of his choice—so that instead of predicting the choice he would be himself making it. But determinism does not rest its case on the possibility of knowing all the conditions of an event. No such knowledge has ever been attained in any instance. Determinism rests its case upon the fact that it has sometimes proved possible to find *just those particular conditions* upon which the event depended. Prediction always abstracts, not only causes, but effects as well. It finds cases of specific, discriminated terms, antecedent and subsequent, that are connected by a law. Its prediction is based on the specific antecedent, and confined to the specific consequence. It asserts that whenever such and such conditions occur, whatever else may occur, such and such consequences will ensue, whatever else may ensue. And Bergson has offered no reason for supposing that such is not the case with human action as well as with other temporal sequences. As a matter of fact it is the case. Human action *is* predictable within limits; inasmuch as laws, such as those of physiology, psychology, and pathology, have been found and verified. So that Bergson's objection amounts to no more than the contention that human action is not in all respects predictable, which holds equally of every other concrete event.

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[9] *Op. cit.*, pp. 193, 194 (italics mine).

[10] *Ibid.* (italics mine).

[11] *Op. cit.*, pp. 189 ff.

Thus the indeterminism that is founded on the polemic against intellectualism can mean no more than that there is plurality, disjunction, irrelevance, and novelty in the world, as well as law. Such indetermination is enjoyed by life and moral action no more than by its natural environment. There is thus no ground for imputing to man any prerogative of freedom by which his nature is distinguished and exalted. Indeterminism in this positive and eulogistic sense depends entirely, then, on the further doctrine that man possesses a unique activity, a real causality of another order, through which he may be the original and spontaneous author of events.

Bergson's positive version of freedom follows from the postulate of "dynamism," as opposed to "mechanism." "Dynamism starts from the idea of voluntary activity, given by consciousness," and "has thus no difficulty in conceiving free force." From this point of view "the idea of spontaneity is indisputably simpler than that of inertia, since the second can be understood and defined only by means of the first, while the first is self-sufficient."[12] Similarly, Schiller says that the will is "the original and more definite archetype, of which causation is a derivative, vaguer and fainter ectype."[13]

Bergson has stated the issue clearly. It is essential to his view that the free creative activity of will should be regarded as a simple and self-sufficient experience. There is, it is true, a suggestion of another view. We are told that the free act is the act of which the "self alone" is the author; the act which expresses "the whole of the self," as distinguished from "reflex acts."[14] But for Bergson the whole of the self is not the sum of its parts; so that it is impossible to construe its action as a more complicated or massive reflex. The "whole personality" is indivisible and unanalyzable; it appears only when conscious states dissolve into a higher unity, and its action can only be felt and not traced. This self-intuiting activity becomes the first principle of Bergson's metaphysics. It connects his theory of knowledge with his theory of will. True knowledge is "the faculty of seeing that which is immanent in the faculty of acting." And activity is the universal substance. "Strictly speaking, there are no things, there are only actions." Activity is no longer predicated merely of the organism as distinguished from the environment. As the former is "the action that is making itself," the latter is *"action which is unmaking itself."* If life is a movement, "materiality is the inverse movement." And "God, thus defined, has nothing of the already made; he is unceasing life, action, freedom. Creation, so conceived, is not a mystery; we experience it in ourselves when we act freely."[15] Thus the sequel to the postulate of "dynamism" is a metaphysical activism or creationism; and in so far as Bergson's philosophy assumes this form, it allies itself with the voluntaristic and romanticist forms of idealism.

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[12] *Op. cit.*, pp. 140–142.

[13] "Riddles of the Sphinx," third edition, p. 443. *Cf.* Appendix I., *passim.*

The sole support of this metaphysics and philosophy of religion is the postulate of dynamism. If it be true that the essential nature of causality is revealed in the experience of activity, then it follows that physical causality is only a projection or inversion of will. Criticism, then, must challenge the postulate. And first of all it is to be pointed out that the *origin of the idea of causality* is an irrelevant consideration. The causation exercised by the will may have been the first to attract attention, and it may remain the most familiar instance; but it does not follow that causation was first *understood* in the case of the will, or that the will is the *clearest* instance of it. As the first and most familiar instance, it may be the most primitive and ill-comprehended. It may be the instance to which crude and uncritical modes of thought are, through the operation of habit, most firmly attached. This suggestion receives support from the fact that the experience of activity is held to reveal the operation of a simple, free, and spontaneous "force," *just in propor-*

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[14] "Time and Free Will," pp. 165, 166, 168.

[15] "Creative Evolution," p. 250, 248, 247, 249–250, 248.

tion as it is not analyzed. "The self, infallible when it affirms its immediate experiences, feels itself free and says so; but as soon as it tries to explain its freedom to itself, it no longer perceives itself except by a kind of refraction through space."[16]

This is Bergson's way of acknowledging that the experience, whether for better or for worse, *can* be analyzed. Now it has already been pointed out that there is a very significant difference between the simplicity that precedes, and that which follows, analysis. The first is the simplicity of knowledge that has not yet fully explored and grasped its object; the second is the simplicity of the object. The knowledge of anything whatsoever is simple at the instant of its initiation; it begins at zero, or spreads from a point which is the bare denoting of its object. To attribute this accidental and subjective simplicity to the object is to fall into the error which I have called the error of "pseudo-simplicity."[17] "Dynamism" depends upon this error. It unites the multiplicity of activity as a process, the multiplicity which it reveals upon even the most cursory examination, with that phase of knowledge in which analysis has not yet begun. The as-yet-simple knowledge of a complex thing is converted into a thing which possesses a complex simplicity or simple complexity.

This is not the same as to say that activity is indefinable. It is not shown to be simple in the sense of having been tested and found unanalyzable. It is not an ultimate term. As a matter of fact, activity has proved definable, both psychologically and physically. Pragmatists like James have gone far toward defining subjective activity;[18] and rational dynamics contains exact formulations of activity in the physical sense. No, one must not *attempt* to define it; it is essentially a something-not-yet-defined. In short, it is nescience presented in the rôle of a revelation of reality. To lapse from knowledge into nescience is always possible—there is no law of God or man forbidding it. But to offer nescience as evidence of the nature of anything, to rank nescience above knowledge for *cognitive* purposes, is to obtain immunity from criticism only by forfeiting the right to a respectful hearing.

Pragmatism offers two versions of indeterminism. On the one hand, it is argued, on pluralistic grounds, that necessity is not all-pervading. There are dislocations in the universe that make it possible to judge parts of it—such as its good, its evil, and its indifference—independently. It is possible to attack evil in behalf of good, without the sense that one's client is guilty of complicity. The world

[16] "Time and Free Will," p. 183.

[17] *Cf.* the earlier article, this JOURNAL, Vol. VIII., p. 673.

[18] *Cf.* James, "The Experience of Activity," in "A Pluralistic Universe," Appendix B.

is not a conspiracy; the game is not "fixed"; the world in the all-inclusive sense is a contact of strange things, a shock of independent forces, and the game of life is honest warfare.

On the other hand, it is argued by Bergson and other pragmatists of the radical wing that there is in man an indeterminate, incalculable, and creative power to do. But the proof of it requires the abandonment of every tried method of knowledge—both the logical method of "intellectualists" and the observational, experimental method which pragmatists themselves have so successfully practised on every occasion but this. Radicalism of this type is not only unreasonable and unverifiable, but it destroys the originality and distinction of pragmatism and allies it with forces of romanticism, mysticism, and irrationalism.

RALPH BARTON PERRY.

HARVARD UNIVERSITY.

NOTES AND NEWS

DR. EDMUND B. HUEY, who has for some time been making examinations of defective children and of aphasic patients at the Johns Hopkins Hospital, has been appointed lecturer on mental development in the Johns Hopkins University and assistant in psychiatry in the Phipps Clinic of the Johns Hopkins Hospital. From January to June, 1912, Dr. Huey will give, at the university, a series of weekly public lectures and clinics on the subject of backward and feeble-minded children, and on related phases of clinical psychology.

THE administration of Radcliffe College has kindly consented to offer to women members of the American Philosophical Association the privilege of engaging room and board at Bertram Hall, from Tuesday evening, December 26, through Friday, December 29, at $1.50 a day. Those who wish to avail themselves of this opportunity are asked to write, as soon as possible, to Dean Mary Coes, Radcliffe College, Cambridge, Mass., naming the intended time of arrival and the time of departure.

PROFESSOR FRANZ CUMONT is delivering a series of three lectures on "Astrology and Religion in Antiquity" at Columbia University. The lectures are as follows: December 19, "Origin and Dissemination of Astrology and Star Worship"; December 21, "Astral Theology and Astral Mysticism"; December 22, "The Astral Doctrine of the Future Life."

THE Société Française de Physique has arranged a series of nine lectures on "Modern Ideas on the Constitution of Matter," by Madame Curie, Professors Langevin, Perrin, Weiss, and other distinguished physicists. They are to be delivered on Saturday evenings during the next four months either at the Sorbonne or at the rooms of the society, and are open to all members of the society.—*Nature.*